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LOCAL STAKEHOLDERS' USE OF FOREST RESERVES IN KASYOHA-KITOMI FOREST LANDSCAPE, UGANDA AND NGURU SOUTH FOREST LANDSCAPE, TANZANIA

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Abstract

Tropical forests are characterised by stakeholders with multiple and often conflicting interests. This paper identifies and analyses local stakeholders in the Participatory Environmental Management (PEMA) programme in the Kasyoha-Kitomi forest landscape in Uganda and the South Nguru forest landscape in Tanzania.

The overall objective of the PEMA programme is to pilot and promote an approach to the management of natural resources in two high-biodiversity Forest Reserves and surrounding landscapes that reconciles the conservation and development interests of multiple stakeholders at local, national and international levels. The Danish Institute for International Studies had as one of its task to carry out an analysis of local stakeholders i.e. the rural people in the forest landscapes, who directly or indirectly benefit from services provided by the forests.

The image of stakeholders and interests in forest management is complex and stakeholder analysis provides a means to start understanding it. Based on the stakeholder identification methodology (Ravnborg and Westermann 2002) the paper investigates stakeholders and the interdependencies among them with regard to the management of natural resources. Point of departure is taken in individuals' interests, and previous and current uses of services provided by the Kasyoha-Kitomi Forest Reserve and Nguru South Forest Reserve are documented. These services are for instance the provision of agricultural land, wood products, NTFP, hunting, fishing, grazing and the less tangible services such as climate regulation, water quantity and quality. Where possible, interests are distinguished according to social groups. It is concluded that local inhabitants' stakes in the forest reserves are determined by their access to technology, capital, markets, skills, as well as their locality, gender, age, ethnicity and (lack of) alternative livelihood strategies. In addition, the context of inter-related demographic and socio-economic processes that influence patterns of resource use and determine (and change) local inhabitants' interests in and use of the forests are described and conflicting interests and interdependencies identified.

The stakeholder analysis provides a start to understanding the complex picture of interests attached to the forests and the potential for involving local stakeholders in the PEMA programme. The paper concludes, among other things, that activities such as cultivation within the forest reserves, labouring in logging activities, collection of material for thatch and sambu oil seeds are mainly the interests of the poor local inhabitants. Findings from both forest landscapes show that NTFP such as weaving and thatch material constitute important sources of income for

the local inhabitants including the poor and should thus be considered when negotiating use rights to resources in the forest reserve. In general, it is recommended that profound attention is given in the PEMA programme to improving the local stakeholders' access rights to the forest reserves and not just meet the interests of more powerful non-local stakeholders

Acronyms

CBFM	Community-based Forest Management
CFM	Collaborative Forest Management
FBD	Forestry and Beekeeping Division
ICDP	Integrated Conservation and Development Projects
JFM	Joint Forest Management
NFA	National Forest Authority
NTFP	Non Timber Forest Products
PEMA	Participatory Environmental Management
PFM	Participatory forest management
VEC	Village Environmental Committee

1. Introduction

Tropical forests are characterised by actors with multiple and often conflicting interests. The state, the private sector, NGO's, individuals, social groups and communities all have vested interests in forests. Much progress in forest governance has been made in many developing countries towards participatory forest management aiming at decentralised management. However, there is still a way to go to involve the rural inhabitants including the poor and other marginalised groups in a genuine way.

It is well documented that forests provide a variety of livelihood options to rural people in terms of key safety net functions, subsidy and marketed forest benefits such as food, water, timber, recreational and spiritual services (Cavendish 1999). Policies to conserve forests may increase the competition over these services if the total amount of resources, which can be legally used, declines.

When policies restrict access to natural resources the costs often fall on the poor who least can manage to bear them and, therefore, may ignore, circumvent or resist such restrictions in order to secure their livelihood. This is an undesired situation seen from the perspective of resource conservation as well as from that of poverty alleviation.

Today, the involvement of the poor in resource conservation programmes is to an increasing extent recognised as crucial in order to make collective natural resource management arrangements work (Kerr 2002). Improved environmental management does not, however, necessarily result in poverty eradication or vice versa. Recent literature emphasises that while poverty reduction and environmental sustainability goals can be reconciled and tradeoffs minimised, there is no simple relationship that brings benefits on both fronts (Barrett et al. 2005). Therefore, the interests of the poor and how these differ from those of other stakeholders should be identified and genuinely considered in the elaboration of conservation programmes.

"Participatory Environmental Management Programme" (PEMA) is a research and development programme funded by Danida as an alliance programme and implemented by a partnership composed of CARE-Denmark, CARE-Tanzania, the Danish Institute for International Studies, Nature Uganda, the Tanzania Forest Conservation Group, the World Wide Fund for Nature-Denmark and the World Wide Fund for Nature-Eastern Africa Regional Programme Office (PEMA 2003). The first phase of the programme is running from

2004 to 2006 in the Kasyoha-Kitomi forest landscape in Uganda and the South Nguru forest landscape in Tanzania.

The overall objective of the programme is to pilot and promote an approach to the management of natural resources in the two high-biodiversity forest reserves and surrounding landscapes that reconciles the conservation and development interests of multiple stakeholders at local, national and international levels. To balance such diverging and sometimes conflicting interests the programme emphasises the importance of *i*) sufficient transfers of powers to local institutions and the enhancement of their capacity to manage them sustainably; *ii*) ensuring that local people are fairly rewarded for their role as stewards of the environment. The programme uses a forest landscape restoration approach that understands the broader landscapes as lived-in working areas, which are central to the use of the forest (PEMA 2003).

The Danish Institute for International Studies had specifically as one of its tasks to carry out a stakeholder analysis in order to identify central actors in the management of the forests in the programme sites. The present paper attempts to meet this objective regarding local stakeholders, i.e. the rural people in the delineated forest landscapes, the Kasyoha-Kitomi forest landscape in Uganda and the South Nguru forest landscape in Tanzania, which directly or indirectly benefit from services provided by the forest.

The image of stakeholders and interests in forest management is complex and the stakeholder analysis provides a means to start understanding it, by shedding light on the complexity of interests attached to the forests and the role that the poor play in its use and management. It aims to contribute to a better analytical basis for understanding local stakeholders and thereby ensure the influence of rural people and help facilitate their interests in multiple stakeholder negotiations. Ultimately, negotiations can be used to coordinate management decisions of natural resources in the form of management plans with stakeholders, among whom interdependencies exist, and thereby improve interventions, predict and mitigate conflicts and engage the poor as participants.

The rest of the paper is organised as follows: Section 2 describes the methodological framework for identifying local stakeholders' interests and presents the fieldwork process. Section 3 and 4 present the findings of the stakeholder analysis from the Ugandan respectively Tanzanian forest landscape. Finally, conclusions are drawn, with emphasis on the potential for involving local stakeholders in the PEMA programme.

2. Methodology

A stakeholder analysis is empirical; it is concerned with actors, who have a stake in the object of inquiry, and is not led by any presumptions on the type of actor to be in- or excluded from having a stake. According to Gimble (1995) the term stakeholder refers to "*all those who affect, and/or are affected by the policies, decisions and actions of the system. They can be individuals, communities, social groups or institutions of any size, aggregation or level in society*". The present stakeholder analysis is restricted to local stakeholders, i.e. the rural people living in the forest landscape, who have a stake in the services provided by the forest reserves in the two forest landscapes defined by the PEMA programme. Local stakeholders' interests can be related to the production, extraction, transformation of products, exchange, distribution or consumption of natural resources; i.e. interests found along the lifetime trajectory of services provided by the forest (Ribot et al. 2003).

A methodological implication of the stakeholder definition is that the understanding of 'community' as made up by people with a common identity and common interests is deconstructed. Common interests may seldom coincide with a community of clear geographical boundaries that is made up by local inhabitants sharing goals and values. On the contrary, communities are heterogeneous and made up by multiple actors with multiple interests (Agrawal and Gibson 1999; Mehta, Melissa et al. 1999). Stakeholder analysis is a methodology for exploring these different interests.

The stakeholder identification methodology follows a number of steps (Ravnborg and Westermann 2002). In this study a modified version consisting of two steps is applied in order to fit the context of forest landscapes. These steps are: To define the contiguous area in relation to the natural resource(s) in question and select research sites (Step1); and to identify stakeholders and the interdependencies among them based on individual interviews (Step 2).[1]

[1] Based on the identified stakeholders, three steps aiming at improved collective natural resource management follows as proposed by Ravnborg and Westermann (2002) i) Bringing conflicts and interdependencies into the open and negotiating options for improved natural resource management; ii) Develop coordinated actions through the development of natural resource management plans; and iii) Implementing and adjusting the natural resource management plans.

In this study the forest landscape – a contiguous area that includes a primary conservation area, a forest ecosystem area, a core landscape and an extended administrative landscape – was identified in the two sites by PEMA institutions in an initial phase of the programme formulation. After having defined the landscape and made a first approximation of its outer boundaries, an examination of the context of the forest landscape was made through the elaboration of landscape, forest and institutional inventories.[2] Drawing on parish (Uganda) and ward (Tanzania) profiles, respectively 30 parishes, (approximately 300 villages) in the Kasyoha-Kitomi landscape and nine wards (comprising 56 villages) in the South Nguru landscape, six research sites were purposively selected in each landscape. The sites were chosen on criteria of maximum variation, which should reflect differing circumstances with respect to livelihood sources, proximity to forest reserve, access to land (i.e. the most important local means of production), agro-ecological conditions, and dependency on ecological services from the forest ecosystem. In addition, access to markets was used in the South Nguru landscape while ethnicity and prevalence of social groups were added as criteria in the Ugandan site. These criteria were *a priori* assumed to determine the presence of different interests in relation to the use of forests. Because of the different scales of administrative units in the two landscapes, the pilot sites were selected to comprise a village in Tanzania (roughly just under 2000 inhabitants on average) and a parish in Uganda (3000-4000 inhabitants on average). The methodology was applied in Bitooma, Butoha, Mwongyera, Kicuzi, Rwajere and Ndangaro parishes in the Ugandan site. In the Tanzanian landscape the villages Pemba, Maskati, Mkindo, Ubiri, Kwadori and Kilimanjaro were included.

After having defined and selected research sites, interviews were carried out in order to understand the multiple interests that stakeholders have in the landscape and how these perceptions diverge or conflict (Step 2). Questions focused on stakeholders' opinions, perspectives, fears and anxieties corresponding to the forest landscape and to the services provided by the forest. Box 1 shows the guiding questions that take point of departure in the individuals' resource uses and perceptions.

[2] Landscape, institutional and forest inventories were developed in each site by national partner organisations. Inventories identified, among other things, location of communities, predominant ethnic groups, main livelihood sources, settlement history, forest policies and regulatory frameworks, the history of the forest reserve, threats to the forest and the presence of local and national authorities and other institutions influencing the management of the forest reserve.

As the objective of the interviews is to identify the totality of interests relating to access, management and use of the natural resources in question, the stakeholder methodology is based on variation and contrast sampling to create circles of interviews (Guba and Lincoln 1989; Ravnborg 2002). This is done by asking the respondent to provide nominations, i.e. names of persons who would have different or contrasting views and interests with respect to the natural resources. This process of interviewing and asking for nomination is continued until no new ideas or interests are introduced, eventually creating circles of interviews. If no nominations are made, one may simply choose another informant, who differs from the previous ones.[3] In the Ugandan site, 87 informants were interviewed. In the Tanzanian landscape a total number of 97 interviews were conducted.

Box 1

Guiding questions:

- Present access to the forest
- Previous access and access rights to the forest
- Use of services from the forest
- Services previously used from the forest
- How to authorise access to the forest
- Threats or difficulties associated with own use of the forest
- Conflicts or disagreements over forest access and use among stakeholders
- Introducing ideas obtained in previous interviews; i.e. "From other people in the area, we have heard that … is that something you recognise?"

After completion of the interview phase the external understandings of stakeholders, as perceived by the researchers, were presented to the people in the selected research sites in

[3] In several of the Ugandan sites selected for interviews, the circles were difficult to continue as tensions between the National Forest Authorities and the local inhabitants made people fear talking about uses of the forest. In general, interviewing on sensitive topics such as posing questions about intra-village conflicts over access, illegal entrance to the forest reserves required some creativity in the fieldwork process. The researchers tried to deal with that by guaranteeing anonymity to informants.

order to jointly revise and refine the identified stakeholders and develop a shared 'construction' of who the stakeholders were and what their associated interests were.

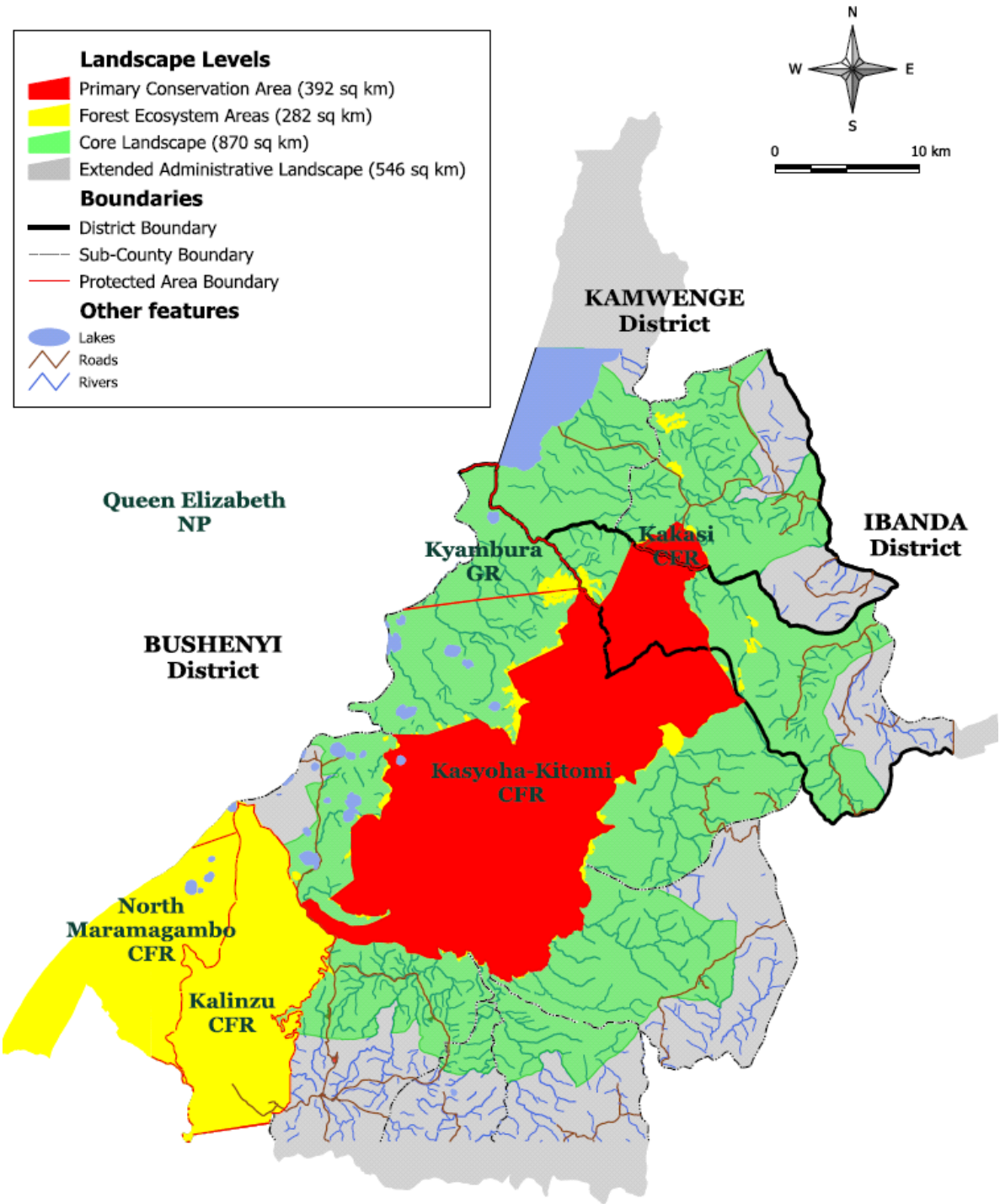
Identifying and analysing local stakeholders can unveil central interests, conflicts and power relations, but cannot stand alone. Hence, analyses of institutional stakeholders (Raben and Namirembe 2006), stakeholders in relation to water environmental services (Lloyd 2006), and a poverty, livelihoods and knowledge, attitudes and practices survey (Boesen, Raben et al. 2006) have been conducted and form other parts of a profound understanding of stakeholders' interests and livelihoods.

3. Kasyoha-Kitomi Landscape, Uganda

Kasyoha-Kitomi Forest Reserve is located in western Uganda, covers an area of 392 km^2 and is situated south of Lake George and the Kazinga Channel in the Albertine Rift. Kasyoha-Kitomi Forest Reserve. The surrounding core landscape covers an area of approximately 870 km^2. The forest lies within the counties of Bunyaruguru, Igara and Buhweju in the administrative districts of Bushenyi, Ibanda and Kamwenge. The Kasyoha-Kitomi landscape comprises 56 parishes, of which 21 are bordering the forest reserve (see Map 1) (National Forest Authority 1999; Franks 2003).

The forest is a medium-altitude moist forest that contains a high number of endemic plants and animals. The altitude ranges from 975-2,136 metres above sea level. Most of the forest reserve is found along the valleys of the western ranges. The rainfall is bimodal with a quantity of 1250 mm-1400 mm per year. In addition to the multiple services provided to the local inhabitants, the Kasyoha-Kitomi landscape has great importance for stakeholders at the regional, the national and the international levels. At regional and national level, the Kasyoha-Kitomi forest reserve, being a key watershed, provides ecological services for Lake George which has one of the most productive fisheries in the country (PEMA 2003). Many thousands fishing families depend on this fishery resource. The Kasyoha-Kitomi landscape lies within the Albertine Rift eco-region characterised by a high number of endemic species. Recent assessments by international conservation agencies classify the eco-region as one of international importance in terms of global biodiversity values (National Forest Authority 1999; Franks 2003).

Map 1. Kasyoha-Kitomi forest landscape



In terms of ethnic composition, the landscape is dominated by Banyankole and Bakiga tribes; however, many other ethnic groups have immigrated to the area, especially the Banyarwanda, Bakonjo and Bafumbira. The villages adjacent to the forest are mainly occupied by immigrants. The area surrounding Kashyoha-Kitomi Forest Reserve is densely populated, ranging from 150-200 persons/km^2. Approximately 150,000-200,000 persons reside in the Kasyoha-Kitomi landscape, of which approximately 50,000 live in villages adjacent to the forest (PEMA 2003).

The high population densities, in-migration and the lack of fertile land cause a general trend of land shortage in the Kasyoha-Kitomi landscape. Furthermore, the land shortage negatively affects the poorest inhabitants of the villages, as the areas with better fertility are mostly owned by the better-off. The land scarcity has not only left soils infertile but also increased the pressure on the forest reserve for fertile land and fuel wood. Currently, only small short shrubs and reeds are common outside the forest reserve. The majority of the larger trees has been exploited for timber and fuel wood.

The western side of the forest reserve, which includes Mwongyera and Butoha among other parishes, is adjacent to the Queen Elizabeth National Park and the Kyambula Game Reserve. The area acts as a biodiversity corridor connecting the national park with the Kashyoha-Kitomi Forest Reserve. Frequently, animal movements along this corridor create incidents of crop raids in local people's fields. Being a game corridor, the place often experiences exoduses of animals as they move either from the national park to the forest reserve or vice verse. Inhabitants have taken the opportunity to hunt down the animals for the meat. This area is also adjacent to the western rift valley, which is drier and flatter. The area also borders with the Kazinga channel, which connects the two water bodies of Lake Albert and Lake George. The lakes function as the source of River Kyambula, which traverses the whole forest reserve providing hydrological and socio-economic benefits to a great number of the inhabitants. The river also supplies water for irrigation. The flat nature of the land and drier climatic conditions characterising the rift valley has enabled a great number of households to cultivate cotton. The presence of many water bodies, including rivers and lakes, has enabled many inhabitants to survive on fishing as a source of livelihood. Other major economic activities include brewing local beer and hunting.

The southern part of the forest reserve, which includes Bitooma and Ndangaro among other parishes, is hilly compared to the western side. The hilly nature and cooler climatic conditions have favoured the production of tea and the rearing of exotic cattle breeds. Cultivation is mainly done along the hill slopes, while the rocky and infertile hill tops are suitable for

livestock production carried out by the better-off households. The southern part of the reserve is characterized by high economic activity due to its proximity to the main road connecting Bushenyi town and Kasese town. The area is easily accessed and therefore many economic activities take place. Activities include small- and large-scale tea growing and processing. The urban centres (including Ndekye and Lutoto) provide markets for the forest products (timber, fuel wood and others). The road also demarcates the adjacent Kalinju Forest Reserve and Kasyoha-Kitomi Forest Reserve. Down south and also bordering the Kalinju Forest Reserve is the large-scale Kyamuhunga Tea Estate. The tea estate has provided a market for a large number of tea-out growers throughout Bushenyi district. Rich land owners and the tea estate own large areas of land, having bought the poor off and leaving them in small areas (e.g. the parishes Bitoma, Igara and Kitojo). The tea estate uses a lot of fuel wood to cure tea. However, evidence indicates that most of the fuel wood used by this factory is acquired from the adjacent Kalinju Forest Reserve (Maramagambo forest) where tree logging continues legally. In addition, the factory has also established private forests to have sufficient supplies of fuel wood.

The eastern and south eastern parts (Rwanjere) and northern parts (Kanywambogo) are hilly and less accessible compared to the southern side. These areas are located far away from the major economic centres. Access to important social services is poor and households are generally poorer than those in the southern and western parts. Most households derive their livelihood from activities related to agriculture. The hilly nature of the terrain, especially in areas adjacent to the forest, constrains the farmers' access to markets as well as access to social services such as health and education. In areas in the south eastern part of the landscape, including Rwajere, many households are engaged in tea growing for the Kayamuhunga Tea Estate.

Kasyoha-Kitomi is classified as a central forest reserve (see box 2). The implementation of the forest legislation, i.e. the regulation of local inhabitants' access to the forest, has, however, been "relaxed" or even non-existent under the former management by the Forestry Department, which showed poor ability to manage the forest. At national level forest degradation was happening at an alarming rate, and institutional deficiencies within the forest department were considered to greatly contribute to this. A restructuring process was therefore initiated, which led to the establishment of the National Forest Authority (NFA) in 2002. Some gazetted forests, among which was the Kasyoha-Kitomi forest, were retained as central forest reserves, which the national forest authority was mandated to manage as economically viable assets and at the same time ensure their sustainable conservation.

Box 2

Ugandan forest policy

In Uganda a new forest policy and a new forest act is due for approval by the parliament. The goal of the national forest policy is "an integrated forest sector that achieves sustainable increases in the economic, social and environmental benefits of forest and trees for all the people of Uganda, especially the poor and vulnerable" In central forest reserves, NFA will be responsible for the management. Particularly relevant in relation to Kasyoha-Kitomi Forest Reserve are the following policy statements: *i*) Collaborative partnerships with rural communities will be developed for the sustainable management of forests; *ii*) Uganda's forest biodiversity will be conserved and managed in support of local and national socio-economic development and international obligations (Republic of Uganda 2001).

A central aspect of the new forest policy is Collaborative Forest Management (CFM), which is defined as follows: "Communities are genuinely involved in the management of the forest resources through a negotiated process in which rights, roles, responsibilities and returns for sustainable management of such forest resources are shared". The policy emphasises sharing of benefits with local communities e.g. income derived from timber harvesting and rights to harvest fuel wood and non-timber forest products. Furthermore, it stresses a decentralization of the management of forest but not devolution of authority to the local level (Republic of Uganda 2001).

With the establishment of NFA, a radical change in the enforcement of legislation occurred. The management of the forest reserve changed from an "open access" situation to an almost complete ban on any legal access. The most important adjustment has been that forest activities in the forest reserves have, with the exception of a few goods in certain parts of the forest, been declared illegal. This has meant a halt to local inhabitants' access to services provided by the forest that used to form part of their daily livelihood activities. Today extraction of forest resources continues today but at much slower pace. As one informant described the new situation,

> Before restrictions were also there but they were not as tough as now. We would enter the forest and extract whatever we needed. I would get firewood, poles for

> building my house. Others would collect materials for making rope, do some hunting or cutting grass to thatch their house. Now the forest officers are always nearby. They will hear the noise when people are cutting the big trees and they will come and arrest you. They are able to see whoever that goes into the reserve.

Different illegal practices take place in order for local villagers to bypass forest guards from NFA. In a few villages, some activities continue under some form of locally organised rights.

3.1. LOCAL STAKEHOLDERS' INTERESTS IN KASYOHA-KITOMI FOREST RESERVE

This section documents the previous and current uses of services provided by the Kasyoha-Kitomi Forest Reserve as identified by local stakeholders. Interests are distinguished between different well-being levels, age and gender where it is possible.

Cultivation within the forest reserve

Cultivation took place in the forest reserve before NFA declared it illegal. In all research sites except for Kicuzi the Forestry Department tendered out the depleted areas within the reserve to individuals to cultivate if they planted trees. The schemes were based on the idea that the open patches or grasslands within the forest can only revert to forest through replanting schemes. A central reason for people's participation in the schemes was land scarcity, and the majority of the local inhabitants entering schemes were either landless men or women or people owning small plots - the poor local inhabitants.[4] The individual, who got the tender, normally non-local people, would sublet to other people, who were expected to look after the trees while cultivating the land for their own households. The Forestry Department would provide tree seedlings, mainly pine and eucalyptus. After about three to four seasons the farmers would be allocated other open patches to repeat the procedure.

The replanting arrangements faced a number of problems, including nepotism pertaining to the award of the tenders and farmers uprooting the trees in order to extend the cropping period before being reallocated to new areas. The fact that the local inhabitants did not have access to the use of the replanted trees has meant a lack of incentives to invest labour in

[4] Findings from a poverty survey conducted in the landscape Boesen, Raben et al. (2006) substantiate the findings by showing a significant relation between degree of poverty and land ownership in the landscape. The 63% poorest households owning less than an acre of land.

replanting. In most parishes the tender arrangement has broken down, however, in Butoha and Munyoyi-Mwongyera parishes the arrangement continues.

Clearing of forest land for finger millet cultivation is another agricultural activity taking place in the reserve. The finger millet production requires a clean and virgin seed bed. The agricultural land is hard to prepare in many areas of the landscape outside the forest reserve, i.e. it needs to be prepared twice before planting, whereas the land in the forest reserve only needs one tilling. Therefore slash and burn within the forest has been widely practiced. As explained by a farmer,

> The land around the village is hard to dig and the land in the forest is soft. When you prepare the land you first come and dig there. Then you return and dig second time. But when you go to the forest you simply cut, burn and plant. So to avoid all those processes we prefer to cultivate in the reserve.

Mostly poor men and women in need of agricultural land have been engaged in this activity. Yet, in the view of many informants, the majority of people would be interested in cultivating the fertile land. In some parishes (Bitooma and Munyonyi) the cultivation of finger millet has, according to informants, created a high food security for households that opened up land in the forest reserve. The strict law enforcement carried out by NFA, means that currently only very few people continue clearing land in the reserve.

Stakes in wood forest products

A large number of uses of wood forest products was identified in Kasyoha Kitomi forest reserve. Before NFA came into power, legal and illegal *timber-logging* was widely practiced. At that time a licence to harvest timber was attainable. Timber harvesting is an expensive business and the cost of acquiring a license is unaffordable for most of the local inhabitants (about 1 million USh/561 USD). Only a few better-off men from within the parishes have had a license as well as the equipment required. This meant that stakeholders from outside the parishes, people from the district headquarters or outside the districts, have acquired the majority of licenses, which mainly was sold in non-local markets. Still, local inhabitants used to get substantial income from the logging as people hired out their labour as loggers or carriers of timber to the roadsides in the hilly terrain. These activities have been done by men and boys mostly among the poor. The complete ban on logging by NFA and the decrease in the timber business have had negative impact on local inhabitants' income. Due to its good qualities, timber has traditionally been used as building material, for doors, windows and coffins as well as for containers for brewing, which is an important activity in the local

economy. The current complete ban on logging in the forest has caused a lack of timber, not least timber for coffins is claimed to be in short supply. A carpenter presented the situation in the following way,

> The problem is timber. We carpenters have lacked timber since the day that they stopped us from going there. Now I use eucalyptus and old stocks of good timber from the forest. I think the government should provide seedlings because we need other types of trees than the eucalyptus. We need mahogany, enkoba, enkaago and ensambya.

Former timber harvesters admitted that highly demanded species e.g. *Mahogany*, *Gravelia* and *Makhamia* were already close to extinction before restrictions on logging were imposed.

The local inhabitants have followed a number of alternative strategies. E.g. carpenters and timber harvesters have shifted their activities to areas where licensed activities take place, such as the adjacent Kalinju Forest. In some parishes people have substituted with eucalyptus trees. For instance the better-off among the local inhabitants in Bitooma Parish explained that they had turned to establishing private forests, but even these have not been sufficient to satisfy the high demand for timber and fuel wood. The land scarcity in the landscape meant that private forests have competed with land allocated for crop production. In some parishes the use of "alternative" timber from private lots is constrained by the fact that the parish council requires a permission if people intend to log their private trees and forests. Finally, it can also be a strategy to continue illegal logging. Some village councils have applied by-laws restricting people from entering the forest with any tool in order to stop the illegal harvesting.

Besides logging larger trees a sizable number of men and women collect *poles* used in the construction of houses. Also the collecting, making and selling of *walking sticks* is a common activity as this is a valued commodity used to prevent sliding in a terrain that is hilly and rough. The producers of these sticks insist that straight and hard sticks can only be found in the forest. This also applies to *hoe handles*.

Fuel wood collection is the activity within the forest reserve that most local inhabitants have had a stake in. Women of all ages collect fuel wood mostly for cooking. Male youths, often poor with few alternative income generating activities, derive an income from the sale of collected fuel wood. Access to fuel wood has decreased tremendously after the appearance of NFA. According to some informants families now spend nights without food because they have no firewood for the preparation of meals. The local authorities have responded in different ways

to the situation. In some places, for instance in Mwongyera Parish, the parish council has relaxed the strong position taken by the NFA. By-laws have allowed villagers to enter the forest legally to collect fuel wood on one or two days per week. However, not everybody seemed to be aware of that possibility. In other parishes people have been completely prohibited from using the forest reserve for fuel wood collection. This has caused an increase in the pressure on the surrounding landscape as local inhabitants have sought alternative sources of fuel wood. In some villages people have turned to their own tree plots for fuel wood, but in most cases the amount has been too small to substitute the previous source from the forest. Households have then turned to the small available shrubs or, of necessity, turned to the use of banana fibres.

Waragi brewing (a local gin) is a major source of income for many households. Mainly women and to a lesser extent men undertake the brewing. The production involves distilling the raw materials (bananas), which demands a lot of water and firewood. It is most likely that the fuel wood used is gathered from the forest reserve.

The waragi brewing has to be located next to a stream. The distillers have been blamed for disposing the residues in streams causing contamination of water used for domestic purposes.

Burners of *charcoal* used to have a big stake in the forest reserve as the source of wood for their production, which formed a major source of income. Especially among male youth this activity forms a major source of income. In some areas people used to buy an annual license to cut timber for burning charcoal. According to some charcoal burners, their activity has led to the overuse of the best quality timber for charcoal production, such as *omurama* and *murenje.* Despite the current restriction on the access to the forest reserve illegal charcoal burning continues. The burners normally do it at night when they cannot easily be detected. According to informants the production takes place at small scale for sale in the local trading centres. Accordingly, the distance to such a market is a determinant for the relevance of the activity. Also the private forests can provide charcoal burned from eucalyptus, although the amounts are said to be insufficient.

Wild honey collection and honey production

The local inhabitants have traditionally spent time on wild honey collection, which is considered as a good business if markets can be accessed. Especially the youth have derived an income from this activity. Due to the strict regulation of access to the forest, this activity is now mostly done at night. The collection involves setting fire to the beehives to scare off the bees and then cut the tree to harvest the honey. Some people indicate that this causes damage

as the trees die from the wounds and fire. Production of honey by putting up beehives is not very common in the surroundings of the forest reserve and was only found in the Kanywambogo and Ndangaro parishes.

Collection of medicinal plants

Local medicine collection is perceived as an important forest activity in all the visited parishes. Traditional medicinal practioners play an important role in the primary health care for the local inhabitants in the Kasyoha-Kitomi landscape. In the parishes that do not have a local health centre, the only access to treatment is to attend the local healers, who base their treatment on medicinal plants from the forest reserve. The traditional medicinal practioners harvest roots, leaves, climbers and tree barks in the forest reserve. Some traditional healers emphasised their specific interest in mature trees to produce a good powder for medicine. Elderly men and women largely dominate this stakeholder group. The women mostly process the medicinal plants while the men are the ones who enter the forest to look for the specific trees or plants. No cultivation of medicinal plants takes place and the traditional healers claim that the main source for collection of medicinal plants, of which some are very rare, is the forest reserve. Currently, no legal harvesting of medicinal plants takes place.

Hunting and fishing

Hunting and game trapping have traditionally been activities in the villages surrounding the forest reserve. Before the forest came under supervision by NFA, men would kill wild pigs, Uganda cobs, antelopes and monkeys. Hunters would burn the open grasslands in the dry season to prepare them for greener pasture in the next season. The greener pastures would then function as bait while hunting. Hunters are mainly young males and at times aged men. Currently, no legal hunting takes place in the forest reserve. In some parishes the practice continues, as people insist that 'they cannot prevent us from entering the forest to hunt'. In Bitooma Parish people are not aware that legal hunting has been banned.

Hunting has a direct and indirect purpose. The direct is the provision of bush meat although baboons and other monkeys are perceived as inedible. In some areas a market for bush meat exists and, according to hunters, provides a good income opportunity. Indirectly, the hunters have played a central role as controllers of problem animals. People fear that the current restrictions on hunting will increase crop-raiding by wild animals in fields adjacent to the forest. Informants estimate that owners of forest adjacent fields use up to eight hours per day to guard their fields.

Fishing traditionally has been a resource of great importance among the villagers. While fishing is currently not allowed in the forest reserve it continues within and at the border of the reserve.

Grazing cattle in the forest reserve

Before the restrictions on the use of the forest reserve were introduced livestock owners would send their cattle and goats to graze at the forest boundary and within the reserve. When the above-mentioned tree planting tender arrangement was introduced the interests of livestock owners were conflicting with those of the local inhabitants cultivating the depleted areas. As explained by a livestock owner,

> We used to go to the forest reserve to graze our cattle. We sat fire to prepare the land for pasture in the coming season. The same open patches were also of interest for the poor who wanted to cultivate and plant trees. So there has been competition over the land. Some of us even had to sell our animals and others converted some agricultural land into pasture.

Grazing livestock in the forest reserve is an activity that has mainly been done by the better-off or less poor people in the villages, as they are the owners of cattle and goats, whereas the poor do not have such possessions.[5] Within the household it is mostly boys and men that graze cattle. Women and girls at times graze the goats.

Materials for weaving and thatch

The open grasslands in the forest harbours good quality thatching grass. Many households have depended on this grass for thatching their houses. Especially the poor roof their houses with banana leaves and thatch as they cannot afford to buy iron sheets.

As fishing and tea growing are some of the major income generating activities in some areas in the landscape, weaving baskets and fish traps is a central activity. Weaving materials are to a large extent harvested within the forest reserve. The customers of these baskets are to a great extent people from neighbouring trading centres. Accordingly, basket making for fishing and harvesting forms a central contribution to people's livelihood. In some villages, for instance Mwongyera Parish, rough estimates indicate that 10% of the local inhabitants are involved in

[5] According to the poverty survey only 7% of the poorest households in the Kasyoha Kitomi landscape own cattle (Boesen, Raben et al. 2006)

this activity. Mostly young and elderly men go to the forest to look for the weaving and thatching materials. Largely young and elderly women weave the mats and baskets, but men take part in the making of fishing traps. Also mats and ropes are produced for own use and local markets.

Less tangible services from the forest ecosystem

Besides the above-mentioned benefits provided by the forest, stakeholders do enjoy a number of less tangible services from the ecosystem. The following listing of ecological services indicates the biophysical processes that the local inhabitants consider as benefits from the forest reserve. The forest ecosystem provides ecological services in the form of water quantity and quality. The local inhabitants fetch water from the nearby streams. It is claimed that, in recent years, these streams have started drying up in the dry season. As an aquatic habitat the streams and rivers form the habitat for fish, which is a central source of income and food opportunity. At the western side of the forest reserve irrigation of fields is made from water bodies coming from the forest. Among other of the less tangible services mentioned, the local inhabitants emphasize climate regulation and rain formation. It is a widespread belief that the local climate has become drier and more unstable the past decade due to the depletion of the forest. Local inhabitants, especially among the elders, mentioned their appreciation of the forest reserve as a provider of cultural and religious services.

3.2. SUMMING UP

The pressure on the forest reserve results from inter-related demographic and socio-economic processes that influence patterns of resource use and determine (and change) local inhabitants' interests in and use of the forest. While no simple causal explanations between expanding human population, degradation, and overexploitation should be made, a number of demographic and socio-economic characteristics may form central parts of the underlying causes. These are: Land shortage, due to declining soil fertility and increasing population density; a long distance to markets and poor roads; few alternative employment opportunities apart from agriculture, and a general mistrust in the local leadership and elite within the villages.

Table 1 summarises the interests of the local stakeholders in Kasyoha Kitomi forest reserves, and the categories of social groups are mentioned where possible.

The following uses of the reserve were identified as conflicting with each other. Access to open patches within the forest reserve has been contested between the people who have an

interest in grazing the livestock and on the other hand the stakeholders with interests in tree planting arrangements, i.e. the wealthy local and non-local people to whom the Forestry Department had given tender and the poor farmers doing the replanting schemes. Currently, both types of activities have "broken down" due to the current restriction on the use of the forest reserve.

The traditional medicinal practioners, charcoal burners and timber harvesters are all looking for the mature tree, which they use for medicine, tree for charcoal making or building material. This well recognised problem was widely perceived as related to the decreasing amount of quality timber as well as the increasing number of users. These users of timber and bark all agreed that they were competing with those interests groups that clear forest land for finger millet cultivation claimed to destroy not yet germinated tree seeds and mature trees. Also hunters, who burn areas to scare up the wild animals, and bushfires caused by people grazing their animals, are perceived to be a major threat to medicinal practioners, charcoal burners and timber harvesters. Finally, the users of the forest, who are currently "labelled" as illegal according to state law, conflict with the forest authorities from NFA enforcing forest legislation.

As the streams and rivers provide water for the majority of the local inhabitants the contamination of the water by the Waragi brewers is also a source of local conflict.

The following interdependencies can be identified in the broader landscape. Within the landscape the establishment of more private forests has meant an increasing competition with farmers, who are in search for agricultural land. This interdependency is mostly a conflict between the better-off/less poor and the poor, who are either landless or cultivate the least fertile land.

Table 1

Local stakeholders involved in resource use in Kasyoha-Kitomi Reserve

Interests of local stakeholders	**Categories of stakeholders and drivers of their interests**
Access to farming land through tree planting schemes.	Mainly poor women and men with little or no land. Characterised by lack of alternative sources from which to derive their livelihood.
Benefits from controlling tender license for replanting the open patches in the forest.	A few better-off local inhabitants administrating the tender licenses. Characterised by access to capital and/or relevant authorities.
Clearing of forest for finger millet cultivation.	Mostly the poor women and men among the local inhabitants.
Grazing of livestock in the open patches where good pasture is found.	Livestock owners, mostly the better-off or less poor local inhabitants. Men and boys graze cattle and goats. To a lesser extent women and girls graze goats.
Logging and trade in timber	A few better-off local inhabitants possessing sufficient capital to buy a license and access to technology.
Income generating activity from labouring in logging activities.	Young men and boys, providing labour and to a certain extent possessing the required technology (ownership of chain- or long-saw), location in the hilly terrain that is non-accessible for lorries.
Logging timber as an income generating activity for the local market or for own use.	Male local inhabitants with the required skills and technology.
Timber as building material for construction of houses, coffins and furniture.	Male local inhabitants with certain professions (carpenters, carvers).
Income from collecting, processing and selling of walking sticks, hand hoes etc.	Local inhabitants with the required knowledge and technology, mainly young women and men and elderly men.

Fuel wood as an income generating activity and for home consumption.	Women of all ages for home consumption, young men for sale. Lack of alternative strategies drives the interest of the latter.
Charcoal burning as an income generating activity.	Require certain skills. Proximity to market (trading centres) and proximity to the forest reserve.
Collection of wild honey for sale and home consumption.	Young men and boys possessing the required skills.
Collection of medicinal plants used for traditional treatment.	Traditional medicinal practioners, mostly elderly men and women, that provide primary health care. Especially in areas close to the forest reserve in parishes with no local health centre.
Hunting bush meat for consumption and sale. Indirectly as a mechanism for protection from problem animals.	Mainly young males and some aged men with required skills and knowledge, located close to the forest reserve.
Fishing.	Requires certain skills and proximity to the streams.
Materials for weaving and thatch used for thatching houses, weaving mats, baskets and fish traps.	Mainly elderly and young men in villages adjacent to the forest are engaged in the collection. Largely young and elderly women are weaving. Also proximity to trading centres determines the interest.
Water for waragi brewing.	Local inhabitants possessing the required knowledge and access to firewood.
Water for home consumption.	Local inhabitants without access to alternative sources of water.
Climate regulation	All local inhabitants are considered beneficiaries of this service.
Spiritual and cultural services	Mainly elderly people in villages adjacent to the forest perform religious ceremonies.

Among the poor people in the Kasyoha-Kitomi landscape the following activities stand out as the most important stakes in the forest reserve.

As it is difficult to get arable land in many parts of the Kasyoha-Kitomi forest landscape it has been a widespread practice to access agricultural land through cultivation in the forest reserve. One of the options has been to engage in the tender arrangements aiming at (re)-planting the open patches within the reserve with trees. Although a number of problems have affected the possible benefits from the schemes it has been one of the few options available. Another way to access land has been to clear forest land for finger millet cultivation. The fertile land has provided a high food security for people involved in this activity. The cost of the current closure of the forest reserve, in terms of lack of land for agricultural land, has to a great extent fallen on the poor.

The extraction of any kind of wood forest products from the reserve has caused short supplies of fuel wood, timber, building poles, walking sticks etc. Supplies of timber for construction, coffins etc. is a need for everyone in the villages, yet for the poor the situation is more severe. The poor often do not posses land, technology or capital that make them able to follow alternative strategies.

Activities such as logging and carrying of timber, hunting and collecting weaving materials are especially related to the male youth. While young men cannot be described as a common group of poor people, they can be characterised as being at a stage in their life where momentarily they face poverty, before they are provided with (or buy) agricultural land. Hence, the mentioned activities seem to form a central part of their livelihood at a stage where few other activities are possible.

4. South Nguru Landscape, Tanzania

The South Nguru core landscape (1425 km^2), located in the South Nguru Mountains, comprises the Kanga Forest Reserve (67 km^2), Nguru South Forest Reserve (184 km^2) and Mkindo Forest Reserve (86 km^2), at an altitude of 760 to 2,300 metres above sea level (see map 2). Located in the Mvomero district, Morogoro region, the landscape comprises 56 villages in nine wards. The South Nguru Landscape is inhabited by approximately 60,000 people, of whom 20,000 are estimated to live in villages adjacent to the forest. Population density is 75-125 people per km^2 (PEMA 2003). In terms of ethnic composition, the South Nguru Landscape is inhabited by the ethnic groups of Wanguu and Wakaguru, who are native

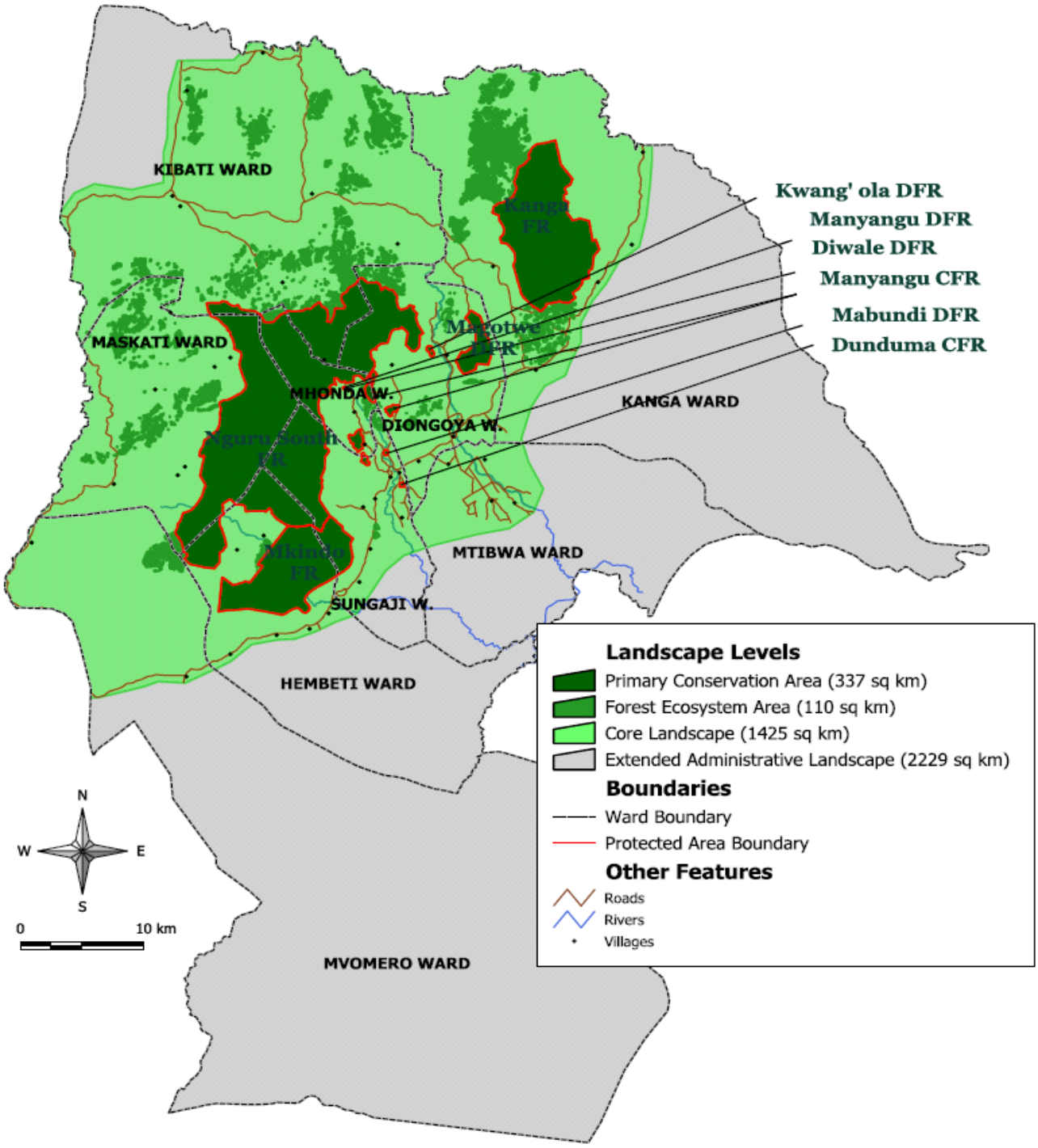
inhabitants in the area and the Wazigua, Wamaasai, Waluguru, Wachagga, Wapare, Wabena, Wasukuma, Wakinga,Wahehe, Wanguni, and Wanyakyusa, who are more recent in-migrants.

Being part of the Eastern Arc eco-region, the South Nguru landscape provides services to stakeholders from local to international level. As part of one of the largest and riches intact rainforest areas of the Eastern Arc, with high levels of plant and animal endemism, the landscape is considered a biodiversity hotspot, but the eco-region is currently experiencing high deforestation rates (Myers, Mittermeier et al. 2000:853). At local level, the forest reserves provide ecological services and goods in terms of timber and non-timber products, agricultural land and water resources. Vegetation types within the forest reserves range from lowland rainforest to submontane and montane rainforests. Rainfall is bimodal with a quantity of 1200-4000 mm on the eastern and south eastern side while the western and north western part is slightly drier with 800-2100 mm per year (PEMA 2003).

At regional level the water catchment of the South Nguru Mountains supplies the largest sugarcane plantation in Tanzania in addition to a number of towns within the region. Wami River is the outlet for the water from the Nguru Mountains. The Wami River, on the way to the Indian Ocean, provides villages and towns with water. The importance of the Wami River as a water source is increasing as a piped water supply to Chalinze town is under construction. A local irrigation project was initiated in 1982, using water from the Mkindo River that originates in the Nguru South Forest Reserve. Other streams flowing from the mountain include the Mvaji that supplies piped water for domestic use in Turiani town and Mhonda village (PEMA 2003).

The pressure on the forest reserves relates to a number of factors. The increasing population in most of the areas in the landscape causes an increasing pressure on agricultural land, declining soil fertility and expansion of the agricultural frontier into the forest reserve, the Miombo woodlands, the traditional woodlots and clan forest. At the same time the usability of land for farming drops quickly as one moves away from the mountainous areas. The relative aridity of the surrounding landscape, (especially on the western and north western sides) limits the population movements in the landscape. Lack of alternatives ways of deriving a livelihood means that people rely on agricultural activities and extraction from the forest reserve. At the same time non-local stakeholders have had and continue to have great interest in timber and other commodities that they extract, process and distribute to markets outside the South Nguru landscape.

Map 2. South Nguru forest landscape



Poor village governance and law enforcement by the forest authorities and, to a certain extent, the involvement of local and central authorities in the illegal activities is another source of threat to the conservation of the forest. According to forest disturbance estimations agricultural encroachment is the most significant threat to the forest, followed by logging and cutting of poles (TFCG 2005).

Livelihoods are centred on agriculture. The main agricultural activities taking place in the landscape are production of sorghum, maize, sweet potato, cassava, yam, sugar and rice. On the western side of the Nguru South and Mkindo forest reserves beans and maize are staple crops, that are traded in the main trading centre of the landscape (Turiani area) on the eastern side. On the eastern/south eastern side, the Mkindo River, a stream from the catchment, provides irrigation for bi-annual rice paddy cultivation. Sugarcane is extensively cultivated in the areas around the Mtibwa Sugar Factory located on the eastern side of the forest reserve. In areas adjacent to the forest reserve, mainly on the eastern side, and within the reserves banana, coffee, yam and cardamom are the main agricultural activities. This part of the landscape, on the edge of the Nguru Mountains, is densely populated and functions as provider of agricultural products for the areas of the trading centre and for the larger towns in the region.

The southern, western and north western sides of the forest landscape are characterised by poor accessibility, isolation from markets and poor basic social facilities. Due to these conditions, a low level of extraction and trade with forest products takes place compared to the eastern side. The population in this area has low levels of well-being as compared to the eastern side.

The eastern side of the landscape is characterised by accessible roads, markets and is the trading centre within the landscape. The main activity that attracts people to that area is the Mtibwa Sugar Factory, which provides labour opportunities in the processing of sugarcane, in addition to growing sugarcane. Besides the fact that the sugarcane production relies on water sources from Nguru Forest Reserve, the production has had a significant impact on the South Nguru landscape in a number of ways. An increasing number of local inhabitants turn to smallholder sugarcane production as a preferable income generating activity. As an indicator of the positive economic influence from the cane production an increasing number of houses are constructed with burned bricks instead of the cheaper mud constructed houses. As firewood is needed for the brick production the demand has increased dramatically. This has caused depletion of the majority of the remaining trees in the landscape surrounding the forest reserves. Furthermore, the Mtibwa Sugar Factory uses a substantial amount of fuel wood for starting up the boilers in the processing of sugarcane, of which some are suspected to be

extracted from the forest reserve. In woodlands on the western side of the forest reserve, trees have already been exhausted and the fuel wood and timber situation may create local conflicts in the future. The increasing population and the interest in sugarcane cultivation create a growing demand for agricultural land. In the longer term this could create an increasing pressure on agricultural land in the core conservation area. In one case (Mjonga River) the growing of sugarcane has made the Mtibwa Sugar Company to divert the river in order to increase sugar production. This has caused a forced relocation of a sub-village and increased the pressure on Miombo woodlands.

Other dynamics in the landscape are the diversity of tribes in the landscape. Due to the high level of unemployment, that was caused by the privatisation policy of the company, many workers, who were initially attracted to the Mtibwa Sugar Company, have now turned to other activities, notably pit sawing. A number of villages have now absorbed these migrants adding to the pressure on the agricultural land. In some areas close to the Mtibwa Sugar Company land has been claimed property of the company, which has pushed villagers to Miombo woodlands in other areas of the landscape. At the same time the declaration of the Wami Mbiki game reserve has pushed people away from the south eastern edge of the landscape.

Box 3

Forest legislation in Tanzania

The central forest reserves in the South Nguru Landscape are under the jurisdiction of the Forestry and Beekeeping Division (FBD). With the passing of the National Forest Policy of 1998 and the New Forest Act of 2002 a process of decentralizing the management of the forest resources was initiated. The overall goal for the forest sector is 'to enhance the contribution of the forest sector to the sustainable development of Tanzania, and the conservation and management of her natural resources for the benefit of present and future generations' (United Republic of Tanzania 2002). The national forest policy introduces a new framework for forest management in Tanzania, which emphasises Joint Forest Management (JFM), which promotes the 'involvement of local communities or non-governmental organisations in the management and conservation of forests and forest lands with appropriate user rights as incentives' (United Republic of Tanzania 2002). JFM has not yet been introduced in the South Nguru landscape.

Currently, legal activities in the forest reserves are limited to the extraction of sambu oil seeds and the use of the path that goes from the western side of the Nguru South Forest reserve (Maskati village) to the eastern side (Ubiri village). Apart from the sambu oil seed extraction, no joint forest management agreements have been established between Forestry and Beekeeping Division (FBD) and villages (see Box 3 for a description of the forest legislation). The control of the resource use in the forest reserves carried out by FBD, village authorities and the village environmental committees (VEC) can be characterised as "relaxed". A kind of "open access" situation exists regarding most forest products in the majority of the villages adjacent to the forest reserve. A local inhabitant explained the "open access" situation in the following way; Nguru is open to everyone but sometimes you have to pay somebody to enter.

Especially in the south eastern, western and north eastern part of the landscape local inhabitants are accustomed to a very limited vigilance by FBD, who are exercising control every second or third year. This should also be understood in relation to the increasing inspection by FBD in the nearby Dunduma Forest Reserve and the Mtibwa Teak Plantation, which, according to local pit sawyers, make illegal extraction of timber and other forest goods more difficult in these forests. Hence Nguru South Forest Reserve, Mkindo Forest Reserve and Kanga Forest Reserve have become more preferred places for illegal extraction.

4.1. LOCAL STAKEHOLDERS' INTERESTS IN THE FOREST RESERVES IN THE SOUTH NGURU LANDSCAPE

The following section presents the use of forest resources as perceived by the local stakeholders in the six research sites.

Cultivation within the forest reserve

Cultivation within the forest reserves is an important activity among local inhabitants. Especially cardamom, cocoa, coffee, plantain and yam are grown in villages adjacent to the forest reserve. Ubiri village constitutes a centre of cardamom production in the landscape, with large areas of under-wood under cultivation.[6] Cardamom growers interviewed complained that no other options than illegally clearing for cardamom growing could derive a reasonable income. While cardamom cultivation mainly takes place on the eastern side of the forest reserve, the crop is slowly being introduced on the western and north western side as the word spread that no sanctions are made against people opening up the forest for

[6] Cardamom requires partial shade and cool temperatures and for these reasons farmers cultivate in the forest.

cultivation. Cardamom provides an important income generating activity and is sold to markets in Zanzibar, Dar es Salaam and other centres at prices between 1000 and 2000 TSh/ 0.9 and 1.8 USD.

Villages on the eastern side of the landscape provide agricultural products for the trading centre on the western side. The production, mainly yam and plantain, takes place outside and inside the forest reserve. Informants mentioned that it is a normal practice for people from villages distant from the Nguru South and Mkindo forest reserves to buy food in the hunger period and during the Ramadan holy month from villages on the eastern side.

In villages adjacent to the forest it is a common practice for those who have farms bordering the reserves to extend their farm inside the forest reserve. This is done by moving the cement beacons that demarcate the forest reserves some meters further into the forest in order to enlarge their fields. Others, who do not have this opportunity, clear the land within the forest, which provides them with fertile soil. A side effect of this practice is uncontrolled fires. In some areas (e.g. Maskati) it was found that the village authorities do not prohibit people from cultivating inside the reserve. In some cases they benefit themselves by issuing a local permit fee.

Grazing livestock in the forest reserves

Pastoralists (Wamaasai, Mangáti and Barbaik) use grazing areas within the South Nguru landscape. They normally enter the landscape for a couple of months during the dry season. Pastoralists graze their cattle in the wider landscape, at the forest boundary and sometimes within the forest reserves. The grazing patterns sometimes conflict with the interests of the local farmers as they destroy water streams and fields as their cattle pass through the area. According to informants there seems to be a slight increase in the number of conflicts as the many areas are getting dryer and forces pastoralist to move more around. The increasing land pressure also results in less non-cultivated areas open to the pastoralists.[7]

Stakes in wood forest products

Extraction of wood forest products is not legal in Kanga, South Nguru or Mkindo Forest Reserve. Still, a large number of uses are related to wood forest products from the forests. Illegal *timber-logging* is widely practiced but the distance from the forest reserves influences the

[7] Pastoralists were not present at the time of field work and therefore were not interviewed, although occasionally local stakeholders in the landscape.

activity that local inhabitants are engaged in. Timber from the forest reserves is considered quality timber compared with the locally grown eucalyptus and is therefore preferred for use in the construction of houses and furniture. Another part of the stock is sold outside the villages in central markets. A number of tree species are mostly found in Nguru South Forest Reserve. According to pit sawyers and carpenters the species with special qualities are *Mninga*, *Mkomba* and *Mkangazi.* On the eastern side of the forest reserve, pit sawyers are mainly in-migrants, Wahehe, Wakinga and Wabena ethnic groups and some local inhabitants, who possess the skills and assets needed for the logging. If pit sawyers do not posses the required capital or assets (e.g. chain saws), timber dealers from the Turiani centre, Morogoro or Dar Es Salaam will meet the costs, including money, for paying in negotiations with local leaders and other related "gate" costs. They will also pay for the replacement of confiscated equipments. On the western/north-western side of the forest reserve, the extraction of timber takes place at a lower rate due to the lack of accessible roads, although the extraction is currently increasing. On that side of the reserve, pit-sawyers are local inhabitants as well as Wachagga and Wazigua ethnic groups entering from other areas.

A common practice among local inhabitants in need of timber is to go to the forest boundary and buy two to five pieces of timber from the pit-sawyers and carry them to the village on foot. If no timber is available, agreements will be made and the timber will be collected later on. A carpenter explained that it was difficult to buy timber in his village. One had to send a message to the forest and the loggers would send somebody to your house and arrange the number of unstamped pieces. He added that legal timber with official stamps was too expensive to buy compared to the market of illegal timber. Another practice is to go straight to the village authorities and get a permit to buy or extract a certain amount. This practice is illegal as regards timber from the reserves, but is a practice used for extraction from village land. Accordingly, *de facto,* village leaders in villages adjacent to the forest reserves control and give permission to enter and extract from the reserves

Another common practice is to buy the "permit" if you are caught. If the amount is little (less than 5 pieces) you can "negotiate" on the spot. Apparently forest officers as well as village authorities (who have no legal role in the vigilance of the reserve) are involved in these "negotiations". Local authorities mostly use their authority to control the timber trade when they are in need of money. In Kanga Forest Reserve this has created incidences of conflict between the police and the mandated forest officers.

The better-off inhabitants employ pit-sawyers and arrange with village government in the villages adjacent to the forest for timber extraction. These traders also maintain timber stocks in their houses.

In Pemba, two practices for extracting timber were identified. One practice is that timber dealers will bring a permit from the district council, and the village authorities will decide if the required amount of trees can be identified. Another practice is that a local carpenter makes an application for a certain amount of timber in the village and a local committee will decide on the application. Although the permit is for extraction in the Miombo woodlands, *de facto*, it applies for both Miombo woodlands and Nguru South Forest Reserve.

Young men in villages adjacent to the forest are employed as carriers of timber from the core conservation area. They normally use bicycles up to the point where it fits and otherwise carry it on their shoulders and heads. The timber is deposited at the traders' houses and is ready for selling within and outside the village. A young man will be paid up to 5,000 TSh/4 USD for carrying the timber to villages at the main road on the eastern side. Because the job as timber carrier is a physically hard job, it is seen as a last option among young men. In one site (Mkindo Village) the Village Environmental Committee (VEC) has been patrolling and has managed to confiscate some timber and working equipment.[8] As a member of a VEC explained,

> We patrol the boundary of the reserve as required but we often get a lot of problems because of the pit sawyers. Sometimes they threaten us so that we have to withdraw. In these cases the only thing we can do is to report the case to the police. Other times we confiscate the timber. Then we can use it for projects in the village like school desks and building materials.[9]

In the majority of households, *fuel wood* is the central source of fuel energy. Fuel wood is mainly collected by women in the farmland, traditional woodlots and Miombo woodlands. Informants in the different parts of the landscape repeatedly mentioned fuel wood as a resource in great scarcity. The exception was Ubiri located within the Nguru South Forest

[8] A VEC is among the standing committees formed at village level.

[9] An example from the records of the VEC in Mkindo showed that between April and May 2004 4 cases of confiscation took place. The number of pieces was between 18 and 58. However, confiscation of timber and tools by the VECs - without a JFM agreement – does not comply with the forest legislation.

Reserve. Women living in villages adjacent to the forest would often collect fuel wood in the forest reserves when distance to other sources become too long. In some villages, the village authorities issue a permit for fuel wood collection in the Miombo woodlands. Also smaller markets for local sale can be identified. This activity is mainly done by young men. Another stakeholder group is the brewers of local alcohol as the production process requires a lot of firewood. Also burners of *charcoal* engage a number of local inhabitants in the villages as a source of income (a sack of charcoal is about 2000 TSh/1.8 USD). Where this takes place in villages adjacent to the forest reserve, the wood is partly collected from within the forest reserve.

The increasing pressure on Miombo woodlands and public forests in the landscape has meant that, to an increasing extent, collection of *poles* takes place within the forest reserve. As a farmer explained with reference to the sources of poles,

> If you see a long and straight pole as part of the house it is from South Nguru Forest Reserve, as they are no longer available in Miombo woodlands. When I was building my house a few years ago, I bought one for 60 shillings; I bought 100 pieces for 6000 shillings but now you can buy one for 500-700 or even 1200 if it is a bigger one.

Often young men and to a lesser extent women derive an income from the collection of poles, walking sticks and handles for hoes within the forest reserve. For instance, in Mkindo village pole collection employs a minimum of ten youth. The poles are traded locally at a range of 50-200 TSh/0.04-0.16USD. Lack of money to invest in brick housing is a decisive factor for using grasses and poles for house construction. While many poles are coming from Miombo woodlands where available, some types are only found in Nguru South Forest Reserve.

Collection of plants

The most important plants collected in the forest reserves are the sambu oil seed collected from *allanblachia stulimanii* and the wild black pepper (*piper capansi*). These plants can only be found in the forest reserve. This study found that the collection of oil seeds provides local inhabitants with not only a source of cooking oil for own consumption but also forms a central source of income. In various villages (e.g. Pemba, Mafuta, Kwadoli, Ubiri and Mhonda) groups of sambu farmers have been formed. These groups have sold sambu oil seeds to an international company through an NGO-initiated project. The majority of the participants are poor women and men.

The wild black pepper is used for medicine and as a spice. The black pepper is famous in towns like Tanga, Dodoma and Arusha, especially during the holy month of Ramadan. For instance Arabic and other traders will come to Pemba village to buy the commodity and also local inhabitants will bring the pepper to markets for sale. For instance it was estimated that fifty people were engaged in the pepper business in Pemba village in 2004. The pepper is collected by mixed groups of women and men, including many young people. Authorities have posed no restriction on the collection of sambu oil seeds and wild black pepper within the forest reserves.

Bamboo is another important plant collected from the reserve. It is harvested at higher altitudes within the western part of the forest reserve. With its quality as light building material it is used for specific purposes in the construction of houses.

Mushrooms are collected in small amounts by the local inhabitants. Medicinal plants and bark are collected to a limited extent by traditional medicinal practioners. These activities are clearly related to location, and only a few people living further away from the reserves would go there to collect the plant material. Tree species for medicinal purposes include *mkwizingwi*, *mviru, mdaha, mwesele* and *mkumba.*

Honey production

Local honey production is not a widespread activity in South Nguru Landscape. At the boundary of the Nguru South Forest Reserve and Mkindo Forest Reserve a small number of honey producers were identified in sites visited.

Hunting

Hunting does not seem to be a widespread activity any longer in the forest reserves. Some informants ascribe this to hunting in the previous decades, which has driven the animals deeper into the forests. This statement was supported by informants living adjacent to the forests claiming that they were not suffering from crop raiding animals. A single case of commercial bird trapping (*Kulukulu* bird) was identified. Birds are sold to an agent in the Dumial area for trade in Dar Es Salaam. It is not clear at what level and intensity the bird hunting takes place. The forest gate price is 2000 TSh / 1.6 USD per bird.

Materials for weaving and thatch

Local inhabitants rely on ropes made from climbers and bark fibre collected in the forest reserves as tying material for house construction. In villages distant to the forest reserves traditional tying materials can also be collected in nearby forests or woodlands, whereas the

better-off villagers can substitute with more expensive sisal rope. Some local inhabitants still prefer the natural ropes as they are said to be stronger.

Less tangible services from the forest reserve

Throughout the landscape, local inhabitants rely on *water sources* provided from the forest reserves. Activities include water used for brick making in river bank areas and provision of water for home consumption. In some areas, especially around Mkindo, irrigation schemes make it possible to cultivate twice a year, including widespread paddy cultivation. The sugarcane growing part of the landscape is another area benefiting from irrigation.

Sacred forest and *places* are used in traditional rituals such as prayers and rainmaking performed by certain clans among the Wanguu. The rituals are performed in traditional forests and clan forests, although the tradition seems to be eroding.

In villages on the western side of the landscape, characterised by a lack of access to markets and poor roads, the *path* going through the South Nguru Forest Reserve forms a vital connection for access central markets (Ubiri and Turiani areas). For instance, the bean and maize production in Maskati forms a central income generating activity that can only be traded by accessing the path to Ubiri and Turiani areas.

4.2. SUMMING UP

In the Nguru South Forest reserves the following inter-related demographic and socio-economic processes influence the patterns of resource use and pressure on the forest. The low prices and poor market access for products in many parts of the South Nguru landscape; the increasing population, especially in the areas of sugarcane farm expansion; few alternative employment opportunities apart from agriculture; poverty, that in some areas, especially on the south western, western and north western sides, is estimated to cause hunger in up to 50% of the households; and unequal power relations between the better-off among the local inhabitants and the village authorities as compared to the poor.

Table 2 summarises the interests of the local stakeholders in South Nguru forest reserves. In the following interdependencies among stakeholders in relation to the use of forest resources are presented.

Timber from the forest reserves has become unavailable or difficult to access due to the increasing control (especially on the eastern side), declining amounts and lack of alternative

sources of (quality) timber. Carpenters drew attention to a number of ways by which other stakeholders' decisions and activities influence negatively on their stake in the forest reserves. As their interest is timber, their concerns are associated with the sustainable management of the forest reserves and the conservation of hardwood timber species therein. The carpenters express their dissatisfaction with the hunters and agriculturalists as these stakeholders create fires when clearing the land for cultivation or burn open patches in order to access wild animals. As forest fires often get out of control, large areas with valuable timber are lost. Their dissatisfaction with the current management of the reserves also aims at the village governments in villages adjacent to the forest reserve as authorities are managing the reserves unsustainable. Furthermore, the carpenters find that accessing (illegal) timber takes place in competition with the timber dealers from towns in the region, who are said to be more powerful and better organised. Hence, non-local timber dealers are accused of having created scarcity in the local markets.

Table 2

Local stakeholders involved in resource use in Nguru South Forest Reserve, Mkindo Forest Reserve and Kanga Forest Reserve

Interests of local stakeholders	Categories of stakeholders and drivers of their interests
Access to farming land within the forest reserve Cultivation of cardamom, cocoa, coffee, plantain and yam.	Local inhabitants engaged in cardamom cultivation are located close to the forest providing the shaded growing conditions. Young men without land are part of the stakeholder group. Others engage in this activity due to the fact that cardamom production is the best option for income generating activity in the local area. Local inhabitants engaged in the cultivation of cocoa, coffee, plantain and yam are driven by the agro-ecological conditions provided by the forest and the availability of land within the forest compared to land scarcity in the surrounding landscape.
Income from transport and distribution of the cardamom (and other products) to non-local markets.	Local and non-local traders.
Grazing cattle in the forest reserves.	Mainly pastoralists (Wamaasai, Mangáti and Barbaik) are grazing at the boundary and within reserves.
Trade in timber.	A few better-off local inhabitants (together with non-local loggers or traders) possessing sufficient capital to buy a license.
Income generating activity from labouring for others in logging and transport activities.	Young men and boys, often poor, characterise this group. Often people located in hilly terrain not accessible for lorries or in-migrants such as Wahehe, Wabena, Wakinga, Wachagga and Wazigua.
Individual timber logging business as income generating activity or for own use.	Male local inhabitants with access to technology.
Timber as building material.	Carpenters by profession.

Income from the collection, making and selling of poles, walking sticks etc. for local trade and own consumption.	Local inhabitants, often young men and to a lesser extent women driven by lack of alternative income generating opportunities.
Fuel wood collection and charcoal production for home consumption and as an income generating activity.	Women of all ages collect for home consumption. Young men collect for sale or for use in charcoal production.
Extraction of plants for income and home consumption.	Traditional medicinal practioners, mostly elderly men and women, that provide primary health care. Sambu oil seeds and wild black pepper are collected by women and men among whom many are young. Collection is determined by proximity to the forest, skills and access to markets.
Bush meat for consumption and sale and protection from problem animals.	Mainly young males and some aged men with required skills and knowledge close to the forest reserve.
Materials used for weaving, thatch and ropes.	Especially the poor rely on weaving material.
Honey for production and home consumption	Men possessing the required skills.
Water for home consumption.	Local inhabitants without access to improved sources of water.
Sacred forests and places for religious purposes	Especially local inhabitants from the Wanguu tribe.
Path through the forest reserve to access central markets	Ordinary local inhabitants and local traders from the western and north western side.

Traditional healers blame the local and non-local pit sawyers for cutting trees that host essential herbs for medicinal purposes.

In the surroundings of the Ubiri village and sub-villages, where cardamom is extensively grown, the wild pepper collectors blame cardamom cultivators for cutting down the under-wood, including the wild pepper trees.

The cardamom growers on their side believe that the local authorities and the forest officers should be held responsible for restricting their access to (more) land in the forest reserves (and at the forest boundary). This hinders them from responding to the increasing demand for their product in the towns.

The VECs accuse local inhabitants for obstructing their boundary control and thereby preventing them from confiscating timber and assets used for illegal timber extraction. In general, the VECs complain about the lack of support to their patrolling at the boundary of the reserve. Some local inhabitants indicate that any authority hindering their access to the forest reserves causes hunger in their households. All in all a great mistrust exists with regards to the management of the forests. Some of the underlying causes are: Under-resourced forest authorities and lack of effective institutional mechanisms to deal with the trade and extraction of timber have created tensions between VEC, the police and NFA.

The following interdependencies have been identified in the broader landscape. Herb collectors, hoe handle makers, and weavers all blame farmers for being responsible for increased distance to areas for collection of materials because of clearing of land for agricultural activities.

Women collecting fuel wood in the landscape complain that local brew makers use up the fuel wood. In the eastern sugar-growing area, fuel wood has become unavailable or expensive due to the cutting down of trees in Miombo woodlands and on agricultural land. This has caused fuel wood to increase in prices from 500 TSh/0.4 USD to 3000 TSh/2.7 USD per bundle in the recent years. In addition, women complain that Mtibwa Sugar Factory has caused a scarcity in water in the surrounding areas.

Performers of religious rituals claim that young men destroy sacred forests, clan forests and sacred places within the forest reserves as they open up new land for agricultural actives. From the perspective of the poor among the stakeholders the following uses of the forest are of particular importance:

In many parts of the landscape it is difficult to acquire farming land, especially if you are poor. Hence, poor people, including young men that have not yet bought or inherited land, clear land in the forest reserves.

If you are poor it is impossible to enter into the timber-logging business yourself as you will not have the capital necessary for "buying your way through". Instead, the poor benefit from labouring for others in logging and transport activities, which are some of the only income generating activities available.

In many parts of the South Nguru landscape, fuel wood is in scarcity. If you do not have trees on your land, if you are landless, or if you do not have money to buy fuel wood you might face great difficulties in obtaining sufficient quantities of fuel wood. If you are poor and live in villages adjacent to the forest your only option might be to collect wood within the reserves. The collection of fuel wood, walking sticks, and building poles for sale may be a central income generating activity for young (poor) men.

5. Discussion of the findings

Stakeholder analysis provides a start to understanding the complex picture of interests attached to the forests in the PEMA programme. This paper has focused on the local stakeholders' use and access to forests in order to identify potential beneficiaries under PFM arrangements and understand who might be negatively affected by imposed restrictions on the use of the forests.

Local inhabitants' stakes in the forest reserves in the Kasyoha Kitomi and Nguru South forest reserves are determined by their access to technology, capital, markets, skills, as well as their locality, gender, age, ethnicity and (lack of) alternative livelihood strategies. In the two landscapes some benefits can be described as mainly interests of the poor local inhabitants. These are: cultivation within the forest reserves whether in tender arrangements or finger millet cultivation, labouring in logging activities, collection of material for thatch and sambu oil seeds. A number of other activities are often related to young men, who can be regarded as temporally poor as they have often not started to benefit from cultivating their own land. These activities are often collection of walking sticks, wild honey and fuel wood for the market or for the production of charcoal. The findings stress the importance of targeting stakeholder groups e.g. women, youth, elderly people or ethnic groups rather than targeting the community *per se* when establishing PFM. As people derive part of their livelihood from

many benefits from the forest, the individuals are often part of more than one stakeholder group.

Findings from both landscapes shows that Non Timber Forest Products (NTFP), for instance weaving and thatch materials, constitute an important source of income for the local inhabitants, including the poor. Often the importance of NTFP is undervalued by conservationists and in conservation programmes or overseen when negotiating use rights to resources in protected areas. The example of black pepper and sambu oil seeds in the South Nguru landscape illustrates the economic potential that some NTFPs can have when traded on local and regional markets. The same holds for the production of weaving mats, baskets and fish traps for local markets in Kasyoha Kitomi forest reserve.

As has been shown, local stakeholders' relations with the forest are highly dynamic. In Uganda the enforcement of the forest legislation has meant a changing relationship with the forest, because most activities have been declared illegal as measures have been taken by NFA to stop the extraction. On the other hand in Tanzania some activities (e.g. extraction of timber and fuel wood) seem to take place at a slower pace. Other activities such as the clearing of land in the forest reserves for cardamom cultivation is currently an economically important activity that is not only taking place in the areas around Ubiri but spread further south as well as to the western and north western sides of Nguru South Forest Reserve.

The study has shown some of the conflicting interests among different kinds of uses of the forest. For instance collectors of wild pepper blame cardamom cultivators for cutting down the pepper trees in Nguru South forest reserves, and collectors of medicinal plants compete with charcoal harvester and timber loggers over mature trees in Kasyoha Kitomi forest reserve. Conflicting interests is an inherent part of the management of natural resources and should be seen as an entry point for improved forest governance. To the extent that local stakeholders obtain use rights to the current uses in the reserves in the two landscapes these conflicting interests should be assessed further and solutions proposed.

However, the greatest barriers to local stakeholders' access are competing interests from more powerful non-local stakeholders such as timber loggers from other areas and authorities enforcing national forest legislation. This can be illustrated by a simple example. International and national interests of preserving the forest reserves due to their unique richness of biodiversity and/or potential as ecotourism sites are not necessarily identical with the interests of the local inhabitants. As explained by a woman from Kasyoha-Kitomi Forest reserve,

> "That forest was a very bad place filled with buffalos and elephants. It was thick and fierce. When the population increased and hunting began the animals ran away or got killed. Now it is a better place to live. If they allow us to cut the trees and clear the whole place, the wild animals that destroy our crops can disappear then we could grow a lot of different things in our gardens"

In other words, the criteria of a well-managed forest depend on the interests of the person you ask. Furthermore, the quote illustrates that forests are not only a source of resources for local inhabitants, they pose risks at the same time.

A central aim of the PEMA programme is to find ways in which interests of local and non-local stakeholders can be reflected in a sustainable and fair way in the elaboration of a Strategic Forest Landscape management plan. Currently, local stakeholders in both landscapes have no or very limited legal rights to participate in the management of the natural resources. Attempts to improve their ability to negotiate with other stakeholders might be difficult for some stakeholders, not least the poor. Others, such as sambu oil seed collectors collaborating with an international company might be in a very different position for negotiating their interests.

Recent experiences from different countries conclude that weak economic incentives for local forest users are a core explanation of the high failure rate of local inhabitants' support to PFM. (Barrow and Murphree 2001) stress that the strength of a collaborative management agreement is subject to the levels of benefits derived from resource use and the contribution to local livelihoods that such resources make. This in turn determines the level of motivation of full obligations as laid out in PFM agreements. Lessons from a CARE implemented initiative in Bwindi Impenetrable National Park, Uganda, showed that although authorities claimed that rights and tangible benefits would be transferred to local communities the outcome meant that more than 100,000 local inhabitants in forest adjacent communities had been only granted a total of 1050 licenses to extraction of resources from within the forest reserve (Raben 2004). A review of recent experiences with PFM in Tanzania claimed that "the economic net benefits of PFM to local communities are often limited, especially in the initial state and especially under JFM, but the net benefits to the state and society in terms of reduced management costs, increased effectiveness of forest protection and securing environmental services are often substantial and immediate (Overseas Development Institute n.d.). Furthermore the study concluded that there is a generic lack of interest in JFM activities among local inhabitants due to the limited benefits to be gained, especially in relation to the conservation of catchment forests in Tanzania.

At the end of the interviews informants were asked to set their vision for their future access to and use of the forest. The local stakeholders' visions were, not surprisingly, often identical with the former benefits derived from the forest reserves. One poor farmer from the Kasyoha-Kitomi landscape explained,

> If I am to advice about the management of the forest. I think the first thing to do is to reduce the amount of money we have to pay in order to enter. For us poor people the licenses and fees are not affordable.

A village leader from Mwongyera recommended that people were allowed to go to the forest reserve to cut wood for the production of charcoal so that the charcoal business in the local trading centre could be revitalised. A farmer living close to Mkindo Forest Reserve summed up the local farmers' interest in going back to cultivating in the reserve,

> We farmers want agricultural land of a better quality. This land is a bit barren. For example when we plant Irish potato it does not come up the way it used to come up. We prefer to continue growing in the forest.

According to local stakeholders' perceptions, fuel wood, timber and agricultural land were most frequently mentioned but due to different individual interests and differences in needs others would emphasise herbs, game meat, bamboos, pasture or access routes.[10] Many resources mentioned had both commercial value and importance for home consumption. The agreements between national authorities and the local inhabitants in Uganda and Tanzania will frame the local inhabitants' future access to resources. Experiences from PFM in Uganda show that even when access is allowed to certain resources, local inhabitants might still rank these as resources missing compared to their former access to and use of these resources (Namara 1999).

Based on the local stakeholders' previous, current and future interests as well as the above-mentioned lessons from previous experiences with PFM in Uganda and Tanzania, profound attention must be given in the PEMA programme to improving the local stakeholders' access rights to the forest reserves and not just meet the interests of more powerful actors in conservation and commercial revenue.

[10] This refers to the path going from Maskati village to Ubiri in the Nguru South Forest Reserve.

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